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Introduction

The availability of communication technologies and student demand for flexible teaching practices has led to university courses being delivered either partially or fully in an online environment (LaPointe & Reisetter, 2008). Online learning presents not only challenges in course design but also opportunities to enhance student learning. The value of online learning communities is supported by powerful learning theories; an active learning community and a sense of connectedness to others are critical to real learning (LaPointe & Reisetter, 2008). Because assessment is the fundamental driver of student learning (Boud & Falchikov, 2007), the design of online assessment activities that drive desired learning outcomes is essential. One method of assessing online learning is by using an online discussion forum. However, while the benefits of online discussion forums for promoting collaborative learning are generally acknowledged in the literature, online discussion forums are not used extensively in higher education (Baron & Keller, 2003). The reasons for this may include the time taken to facilitate and assess them and the fact that there is no consensus on how to ensure that summative assessment of them is fair and reliable.

This paper will review the literature regarding the use of online discussion forums to create communities that facilitate learning. While there is wide literature on online discussion forums and on criterion-referenced assessment there is little literature that targets how to design criterion-referenced assessment for online discussion forums. This is largely due to the fact that online discussion is an innovative and contemporary form of assessment compared to exams or essays. This article will fill the gap in the literature by examining how to design criterion-referenced assessment for online discussion forums applying the assessment principles of validity, reliability and transparency.

First the paper will consider the benefits of using an online discussion forum for assessment and learning in undergraduate law subjects and will discuss the principles relevant to the design of discussion forums in order to facilitate learning. Second the paper will consider the assessment of discussion forums, including the appropriate criteria for assessment. The paper will propose an exemplar rubric for the assessment of a discussion forum in the context of a work placement subject in the QUT undergraduate law course. Finally it will conclude that discussion forums can be a valuable learning and assessment tool provided that they are appropriately designed and assessed.

Online Discussion Forums

Online learning is becoming an increasingly attractive option in a university environment where even students who are enrolled internally do not regularly attend on-campus classes. This has resulted in the availability of online learning tools that present an opportunity to engage students in collaborative learning with their peers that they might not otherwise achieve in the classroom. The use of an online forum can encourage deeper analysis and critical thinking and reflection than a student is likely to achieve working alone or in a face to face situation with other students. Herrington and Oliver (2002) suggest that online discussions can be used to enable socially-mediated reflection. Students benefit from participating in discussions initiated by other students, they can seek clarification from other students, and build a sense of a scholarly community (Brown, 1997; Laurillard, 2002). The benefit of asynchronous online discussion is that students have time to carefully consider their own and other student's responses, and can "rewind" a conversation, to pick out threads and make very direct links between different messages" (Salmon, 2002, p. 35). Studies have suggested that online community discussion has been well received by students and can result in discussions that are "engaging, vibrant and active" (Revill & Terrell, 2005, p. 240).

While the potential benefits of online discussion forums are clear, Brooks and Joeng (2006) point to research that suggests that online discussion often lacks coherence and depth, with students not responding to what other students have said. In order to create the "engaging vibrant and active" discussions noted by Revill and Terrell (2005, p. 240), discussion forums must be appropriately planned and facilitated. Students cannot simply be "given" an online forum and told to use it. Such an approach is likely to result in little collaboration and learning, even when the forum is assessable. The following is an overview of the extensive literature in relation to designing online discussion forums so as to ensure desired learning outcomes are met. The literature suggests three factors that should be considered in planning an online discussion, the organisation of the forum, the motivation of students to participate and the ability of students to participate effectively. Vonderwell, Liang, and Alderman (2007) found that the structure of the discussion forum is essential for successful learning and assessment. Brooks and Jeong (2005) suggest that online discussions should be organised into discussion topics and that within each topic there should be pre-established threads within which arguments are clustered. It is suggested that pre-structuring threads in this way may be an effective method of facilitating in-depth critical discussion. Where discussions are not threaded, discussion may become repetitive, thereby discouraging student participation (Vonderwell, Liang, & Alderman, 2007).

In relation to motivation of students, Klemm (2000) suggests that the goals and purpose of the forum should be stated and clearly explained, feedback should be provided and students should know that the forum is monitored by important people. In addition, input should be rewarded, negative feedback should be avoided and communities should be developed in order to avoid lurking.

The third consideration in planning online discussions is the ability of students to actively participate in the discussion at the required level. Salmon (2002) argues that a scaffolded approach needs to be taken to the facilitation of online activities so that students move through five stages of learning. The five stages are: access and motivation, online socialisation, information exchange, knowledge construction and development. According to Salmon, it is necessary to scaffold student participation in the discussion forum so that they are able to contribute to the forum at the level required. Topics should be established that aim to move students through the stages of learning until they are at the fifth and final stage, development, where they become responsible for their own learning. The crucial role of online activities at this stage is to promote and enhance reflection and maximise the value of online learning for the students (Salmon, 2002). Reflection can be encouraged by posing reflective questions for students to address (Hulkari & Mahlamaki-Kultanen, 2007). This is referred to by Salmon as the “spark” for the online activities (2002, p. 31). The questions should where possible refer to the subject content such as readings relevant to the question posed.

Criterion-referenced Assessment

The assessment of online discussion forums is important because it offers an opportunity to provide formative assessment to students (Baron & Keller, 2003) and also because assessment is a fundamental driver of what and how students learn (Ross & Siegenthaler, 2006). Ramsden (1992) suggests that assessment is a tool for learning for both students and teachers. The students learn about both content and skills from completing assessment, and teachers learn how to develop best practices of teaching. At a basic level, summative assessment of online discussion is a means of encouraging student participation (Macdonald, 2003). According to Swan et al “to encourage online discussion one must grade it, and discussion grades must count for a significant portion of final course grades” (2007, pp. 47-48). One drawback in using summative assessment as a means of encouraging participation in online discussion forums is that it is likely to result in students becoming “assessment driven”, so that their contributions are artificially constructed in order to maximise marks (Oliver and Shaw, 2003, p. 58).

Accordingly, for online discussion forums to be effective in facilitating collaborative learning the assessment of them must be carefully designed. This means that the purpose of the assessment, the criteria for assessment, and the intended outcomes must be established (Gaytan & McEwen, 2007). In addition to establishing clear criteria that indicate the level of acceptable performance (Salmon, 2002), the assessment should also be valid in that it is aligned and flows directly from the online tasks (Salmon, 2002); reliable, so that it is marked uniformly; and transparent, in that there is a shared understanding of the assessment criteria between students and tutors. Hulkari & Mahlamaki-Kultanen (2007) suggest that a truly objective tool to measure learning evidenced by online discussion has not yet been developed.

The use of criterion-referenced assessment in preference to norm-referenced assessment for online discussions is particularly important because it encourages cooperative learning and the sharing of ideas (Klecker, 2005). Vonderwell, Liang, and Alderman (2007) suggest that detailed assessment criteria are essential in guiding student participation and contribution to the discussion and enabling fair assessment of student contributions. Quite aside from any considerations particular to online discussion forums, criterion-referenced assessment is generally considered to be fairer and more reliable than norm-referenced assessment. The benefits to students and staff in using criteria referenced assessment or 'rubrics' have been considered by Baron and Keller (2003). Swan et al (2007) found that where students are assessed according to specific criteria, they are likely to participate more interactively than students who are assessed for participation alone. According to Swan et al "assessment rubrics focussed on critical collaborative processes, will help students achieve desired goals" (2006, p. 47).

In contrast to criterion-referenced assessment, norm-referenced assessment grades a student's work against their peers on a pre-determined bell curve (Dunn, Morgan, O'Reilly & Parry, 2004). This means that a particular student may pass a subject in one year, but fail it in another year, depending on the quality of the cohort. This approach is unfair to students and does not clearly show the alignment between the assessment and learning objectives. Biggs notes that the primary reason for constructing norm-referenced assessment is because it is convenient for the tutor (Biggs, 2003). While convenience may be one factor to take into consideration when designing and implementing assessment, criterion-referenced assessment is more pedagogically sound because it is hinged on the principles of validity, reliability and transparency (Biggs, 2003). These assessment principles will be discussed and applied in turn in the context of online discussion forums.

In the context of designing criterion-referenced assessment for online discussion forums, there are several key conceptions that should be introduced.

These include criterion-referenced assessment, criteria, performance standards, performance descriptors, and norm-referenced, which will be discussed in turn. Criterion-referenced assessment grades a student's performance against explicit criteria, which should be provided and explained to the students in advance of completing the assessment (Le Brun & Johnstone, 1994). It "involves a prescriptive marking regime", but also necessitates a tutor to use their professional judgment to determine the appropriate performance descriptors for a piece of student work (Burton, 2007, p. 59).

Criterion-referenced assessment should explicitly set out the criteria, performance standards and performance descriptors. Scarino defines a 'standard' as "a definite level of excellence or attainment, or a definite degree of any quality viewed as a prescribed object or endeavour or as the recognised measure of what is adequate for some purpose, so established by authority, custom, or consensus" (Scarino, 2005, p. 9). The performance standards should equate to grades and/or a percentage of the mark (Burton & Cuffe, 2005). There is no right or wrong number of names for performance standards, but it may depend on the number of grades at the relevant university or institution. In the QUT School of Law, seven grades are used, but the criterion-referenced assessment usually involves four performance standards. The reason for this discrepancy is that the task of articulating the boundaries between the performance standards is much more difficult as the number of passing grades increases. The criteria for an assessment task should stem from the learning objectives, which may include skills (Burton & Cuffe 2005; Macdonald 2003). Arguably, the criteria should be listed in order of priority or weight to give students an indication of what to place emphasis on.

Where the performance standards and criteria intersect, there is a performance descriptor. Crafting performance descriptors is a challenging step in designing criterion-referenced assessment. Tutors may find themselves agonising over the wording initially, and refining them with the benefit of feedback from cohorts over time. Upon reflection, there may be a shift in the learning objectives and this should be incorporated into the criterion-referenced assessment. The performance standards, criteria and performance descriptors are generally presented in a grid or rubric which easily sets out the performance required in order to achieve each grade. The following table offers a generic framework for developing criterion-referenced assessment.

Table 1: Generic framework

Performance standard	Poor <50% (Grades 1–3)	Satisfactory 50–64% (Grade 4)	Good to very good 65–84% (Grades 5–6)	Excellent 85 – 100% (Grade 7)
Criterion 1	Performance descriptor 1	Performance descriptor 2	Performance descriptor 3	Performance descriptor 4
Criterion 2	Performance descriptor 5	Performance descriptor 6	Performance descriptor 7	Performance descriptor 8

The conception of ‘validity’ measures the alignment between the learning objectives and the assessment item (QUT, 2003). The literature also refers to this principle as “constructive alignment” and “intrinsic validity” (Bloxham & Boyd 2007, pp. 27 and 34). ‘Validity’ assumes that the learning objectives for a subject and assessment task can be articulated. Boud and Falchikov state that “attempts to capture the complex achievements in the language of objectives simplify and distort them” (2007, p. 78). Similarly, Johnstone, Patterson and Rubenstein state that establishing criteria requires “complex qualitative judgments, not easily reduced to a formula” (1998, p. 34).

Setting appropriate learning objectives for an online discussion forum is a new phenomenon and is a fundamental issue in designing and implementing criterion-referenced assessment in this context. The learning objectives for the online discussion forum should coincide with the subject objectives. In addition to designing a valid online discussion forum assessment task, it is important to ensure that it is reliable.

The principle of ‘reliability’ requires the same piece of student work to be marked uniformly, if it is remarked by the same marker or marked by a different marker (Boud & Falchikov, 2007). Tutors should certainly strive to make criterion-referenced assessment of online discussion forums reliable.

Intrinsically, criterion-referenced assessment provides tutors with a systematic tool that takes the ‘guess work’ out of marking assessment, assists the tutor to identify strengths and weaknesses in a piece of work, justifies why one piece of student work is better than another, and gives the tutors confidence about their marking (Burton & Cuffe, 2005). However, merely providing tutors with a rubric in isolation will not make criterion-referenced assessment reliable, and strategies and scaffolding need to put in place to ensure that all tutors have a shared understanding of the criteria and performance descriptors.

Some strategies include running a workshop for tutors or providing them with written instructions on how to interpret the ambiguous terminology in the

criterion-referenced assessment (Burton & Cuffe, 2005). In the online discussion forum example above, tutors should be conscious that the performance standards build onto each other, for example, 'comprehensive and meaningful' is higher than merely 'meaningful'. They need to appreciate the difference between 'comprehensive' and 'meaningful', 'some' and 'superficial', 'logical' and 'comprehensive', 'insightful' and 'constructive'. The tutors may be provided with a criterion-referenced marked example of a contribution that is 'meaningful' and another that is 'comprehensive and meaningful', to show the variance.

The words in the excellent box, for example, 'comprehensive and meaningful', 'logical and comprehensive' and 'insightful and constructive', should not be interpreted as impossible to achieve (Burton, 2007). At the other end of the spectrum, 'superficial', 'limited' and 'no' in the poor performance descriptor should not be attributed to students who have made a genuine effort at the assessment task. Tutors should also note that the performance descriptors for the satisfactory and poor boxes tend to use a quantitative measure, whereas the quality of the contribution to the online discussion forum is more significant for the good to very good and excellent performance standards.

Another strategy for ensuring that there is a common understanding of the performance descriptors is to instigate cross-marking between the tutors (Burton & Cuffe, 2005). Cross-marking reinforces whether the marks are consistent from marker to marker, and whether the marks need to be moderated before being released to students. Of course, this tactic may not be realistic and depends on the turnaround time for the criterion-referenced assessment, the number of tutors involved in marking and marking workloads.

Ensuring that there is a shared understanding of performance descriptors between the tutors and students is pivotal to the success of criterion-referenced assessment. Some strategies that go toward ensuring this common understanding include explaining the concepts in the rubric at a lecture or tutorial; marking part of the discussion forum at an early stage to give the students feedback on their progress; giving students examples of contributions made on an online discussion forum (from a previous cohort or a simulated discussion forum) at all of the various performance standards; and asking the students to apply the rubric to examples of contributions to an online discussion forum and explaining whether their application was appropriate. These strategies enhance transparency, which is a principle of assessment that is underpinned by fairness and clear communication between markers and students (Bloxham & Boyd, 2007).

Criterion-referenced assessment inherently increases transparency because it streamlines feedback to students and, saves the tutor from writing repetitive comments (Johnstone, Patterson & Rubenstein, 1998). Individual feedback is provided to students by underlining or circling the fitting performance descriptors. Additional tailored feedback may be written at the bottom of the criterion-

referenced assessment sheet, and may be apt where a student falls in between two performance descriptors. In addition to individual feedback being provided on a criterion-referenced assessment sheet, generic feedback should also be supplied to students. Generic feedback should be mapped against the criteria. Any feedback is more worthwhile than merely awarding students with a grade or mark, which Ramsden refers to as “unprofessional teaching behaviour” and “cheating students” (Ramsden 1992, p. 193).

The purpose of this section has been to highlight the benefits of criterion-referenced assessment, particularly as it promotes validity, reliability and transparency.

An Exemplar Rubric for an Online Discussion Forum

This paper will now consider the theoretical principles which have been discussed in the previous sections in the context of a subject in the QUT undergraduate law course, LWB421 Learning in Professional Practice. LWB421 is a work placement subject which was offered for the first time in semester 2 2008 and again over summer 2008-2009. An online discussion forum is used in LWB421 as an alternative to face to face classes. The learning management system used by QUT is Blackboard and accordingly the discussion took place using the discussion tool available in Blackboard. The online discussion forum in LWB421 was designed in accordance with the principles identified in the discussion of the literature above. Because the subject was run as a pilot in 2008 it was subject to extensive evaluation. As part of this evaluation, student focus groups were held. The focus groups revealed that while students believed that the discussion groups were an important part of their learning in the subject, there was dissatisfaction with the assessment of them. Students indicated that they “manufactured” their contributions in order to maximise marks, rather than participating in a genuine discussion. Students in the focus group suggested that the criteria for assessment of the forums should encourage student genuine contributions and participation. As a result the authors have developed an assessment rubric for use in the 2009 offering of the subject which aims to promote genuine and effective student learning.

This paper will now consider the appropriate criteria for the assessment of the online discussion in LWB421. As discussed above, the criteria for the assessment of the discussion forum should align with the learning objectives for the discussion which should themselves coincide with the subject’s learning objectives.

The subject outline for LWB421 contains the following objectives:

1. Provide practical solutions to real problems using your existing legal knowledge and skills including problem solving, reasoning and research; and create connections between legal theory and practice.
2. Develop high level of skills relevant to employment, including skills in time management, oral and written communication skills, and compliance with the procedural requirements of working in a legal office.
3. Take responsibility for your own professional learning and career management.
4. Evaluate and reflect upon your own performance individually and in collaboration with students and work colleagues.
5. Appraise the social and ethical issues that arise in the practice of law.

In the context of the online discussion forum in LWB421, students use their written communication skills and time management skills to demonstrate their knowledge of the legal theory, to explore the nexus between legal theory and the practice of law, reflect on their collaboration with work colleagues, and engage in collaborative learning. Thus, all of the five learning objectives are relevant to the online discussion forum and should be addressed in the rubric.

The following rubric is suggested for the assessment of online discussions in a work placement subject. The rubric is based on the generic framework presented above.

Table 2: Criterion-referenced assessment for an online discussion forum

Online Discussion Forum	Poor	Satisfactory	Good to Very Good	Excellent
Understand legal theory – Subject objectives 1 and 2	Superficial, limited or no discussion of the legal theory.	Some discussion of the legal theory.	Meaningful discussion of the legal theory.	Comprehensive and meaningful discussion of the legal theory.
Connections between legal theory and practice – Subject objectives 1, 2, 3, 4 and 5	Superficial, limited or no links made between the topic's legal theory and the student's professional practice. Significant events in practice are not described. Alternative explanations and future actions are not explored. Inappropriate explanations and future actions are provided.	Some links made between the topic's legal theory and the student's professional practice. Significant events in practice are briefly described. Some appropriate alternative explanations and future actions are briefly explored, but in a disorganised manner.	Logical links made between the topic's legal theory and the student's professional practice. Significant events in practice are described in detail. Some appropriate explanations and future actions are logically but briefly explored.	Logical and comprehensive links made between the topic's legal theory and the student's professional practice. Significant events in practice are described in detail and analysed. Several appropriate alternative explanations and future actions are logically and comprehensively explored.
Collaboration with students – Subject objectives 1, 2, 3 and 5	Superficial, limited or no comments made about other students' contributions during the first 4 weeks of the semester.	Some comments made about other students' contributions during the first 4 weeks of the semester.	Constructive comments made about other students' contributions during the first 4 weeks of the semester.	Insightful and constructive comments made about other students' contributions during the first 4 weeks of the semester.

The rubric does not assess the collaborative product of the discussion, but only the individual student's contribution. This is consistent with findings by Macdonald (2003) that the collaborative product need not necessarily be assessed.

There is limited literature which considers in detail the design of criterion-referenced assessment specifically for online discussion forums. Baron and Keller (2003) suggest a rubric based on the following criteria: writing style and presentation are clear; concepts and arguments are well developed; contribution is responsive to another contribution; and text is supported by references. Each criterion includes several sub-criteria and the resulting rubric is quite long and may be difficult to apply in the context of multiple contributions to an online discussion forum. The rubric in Table 2 above reformulates Baron and Keller's criterion of 'contribution is responsive to another contribution' as collaboration. Requiring the 'text to be supported by references' is loosely connected to the first criterion of understanding theory in the rubric in Table 2. In the context of the work placement subject, concepts and arguments are only well developed if they connect the theory and practice, which justifies the development of the second criterion in the rubric in Table 2.

Swan et al (2006) suggest a number of rubrics suitable for different purposes and their criteria include relevance, originality and quality of writing. 'Relevance' is taken into consideration in the second and third criteria in the rubric above, that is, connections between theory and practice, and collaborations. Certainly 'originality' is rewarded in the rubric above and may be demonstrated by providing an insightful comment about another student's contribution, which is recognised in the collaboration criterion. Despite Baron and Keller and Swan et al placing great emphasis on the quality of writing, written communication skills underpin all three criteria in the rubric in Table 2 and are not assessed twice in an additional criterion labelled as written communication.

At the other extreme, Hernandez-Ramos suggests a rubric which is based on a single criterion which is unnamed but for which the performance descriptors identified are: timely, insightful; evident effort but lacking depth; limited effort, lacking depth; and little or no effort, superficial. Rather than using 'insightful', 'limited' and 'superficial' as criteria in their own right, Table 2 provides a more sophisticated regime whereby these notions are measures for other criteria. Baron and Keller, Hernandez-Ramos and Swan et al have informed the development of the rubric suggested above in Table 2 that goes beyond simply looking at the number or length of online contributions and provides a framework for assessing the quality of online contributions. The contributions from Baron and Keller, and Swan et al, which were discussed above, were used to inform the appropriate criteria for an online discussion forum, and are shown in the left hand column of the rubric in Table 2. The criteria have been specifically aligned to the objectives of the subject and this enhances the rubric's validity.

In LWB421, only one marker was responsible for facilitating and marking the contributions to the online discussion forum and was the key stakeholder in designing the criterion-referenced assessment rubric, and as such the reliability

strategies from Burton and Cuffe discussed above were not required. These strategies ensure that there is a shared understanding of the rubric where there is more than one marker and include cross-marking and running a workshop for the markers.

To enhance the transparency of the rubric in Table 2, the performance descriptors have been designed to streamline worthwhile feedback, and use terminology consistently and sequentially where appropriate. The rubric should be released to students in advance of the due date and a range of strategies discussed above can improve the shared understanding of the performance descriptors between the students and markers.

The rubric presented in Table 2 can be easily modified to suit the needs of other subjects and disciplines, which encourage learning in work placements.

Conclusion

While online discussion forums can be a valuable tool for assessing learning, they need to be carefully structured and managed to ensure that they result in the deep level of collaborative learning, critical thinking and reflection. This paper develops a criterion-referenced assessment rubric for a work placement subject that goes beyond the criteria offered by the existing literature; and is informed by the fundamental principles of assessment such as validity, reliability and transparency. Appropriate criteria for an online discussion forum in a work placement subject include understanding theory, making connections between theory and practice, and collaboration with students. Despite the literature emphasising the importance of written communication skills in an online discussion forum, it is unnecessary to make it an additional criterion in its own right because it underpins all of the criteria identified in the rubric. The exemplar rubric and strategies offered to tutors should attract the summative criterion-referenced assessment of online discussion forums.

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